

WHAT IS CLAIMED IS:

1. A multicoat system comprising

5 (I) at least one constituent (IA) which consists
of or comprises mesomorphic polyelectrolyte
complexes and which can be prepared by

I.1) reacting, in a liquid phase (IB),

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I.1.1) at least one polymeric and/or
oligomeric, organic, anionic
polyelectrolyte (IC) with at least
one polymeric and/or oligomeric,
15 organic, cationic polyelectrolyte
(ID) and/or at least one cationic
surfactant (IE)

or

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I.1.2) at least one polymeric and/or
oligomeric, organic, cationic
polyelectrolyte (ID) with at least
one anionic surfactant (IF)

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in a stoichiometric or non-
stoichiometric ratio,

I.2) pouring the resulting liquid phase (IG) onto a substrate or into a mold and

I.3) allowing it to solidify, and

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I.4) heat-treating the resulting solid (IH);

and

10 (II) at least one coat (IIA) which is three-dimensionally crosslinked and can be prepared by

15 II.1) applying at least one aqueous, thermally curable coating material (IIB) comprising

II.1.1) at least one binder (IIC) and

20 II.1.2) at least one crosslinking agent (IID),

to the surface of the constituent (IA), and

25 II.2) thermally curing the resulting wet film (IIE).

2. A process for producing multicoat systems, in which at least two constituents are applied one

I.3) allowing it to solidify, and

I.4) heat-treating the resulting solid (IH);

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and then, on the resulting constituent (IA),

(II) preparing at least one coat (IIA) which is
three-dimensionally crosslinked by

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II.1) applying at least one aqueous,
thermally curable coating material
(IIB) comprising

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II.1.1) at least one binder (IIC) and

II.1.2) at least one crosslinking agent
(IID)

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to the surface of the constituent (IA),
and

II.2) thermally curing the resulting wet film
(IIE).

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3. A reactive system comprising

(I) at least one constituent (IA) comprising at least one mesomorphic polyelectrolyte complex comprising

5 I.1.1) at least one polymeric and/or oligomeric, organic, anionic polyelectrolyte (IC) and at least one polymeric and/or oligomeric, organic, cationic polyelectrolyte (ID) and/or 10 at least one cationic surfactant (IE)

or

15 I.1.2) at least one polymeric and/or oligomeric, organic, cationic polyelectrolyte (ID) and at least one anionic surfactant (IF)

and also

20 (II) at least one aqueous, thermally curable coating material (IIB) comprising

II.1.1) at least one binder (IIC) and

25 II.1.2) at least one crosslinking agent (IID).

4. The multicoat system as claimed in claim 1, the process for producing it as claimed in claim 2, or

the reactive system as claimed in claim 3, wherein
the mesomorphic polyelectrolyte complexes produced
in liquid phase (B), and/or their precursors, are
purified by repeated precipitation from a solution
5 and redissolution.

5. The multicoat system as claimed in claim 1 or 4,
the process for producing it as claimed in claim 2
or 4, or the reactive system as claimed in claim 3
10 or 4, wherein polyelectrolytes (IC) and (ID)
selected are those whose polymer chains (IC) and
(ID), viewed independently, would not be
compatible but would instead separate again in the
solid phase.

15 6. The multicoat system as claimed in any of claims
1, 4 and 5 or the process for producing it as
claimed in any of claims 2, 4 and 5, wherein the
solid (IH) is heat-treated for from 1 minute to 10
20 hours.

25 7. The multicoat system as claimed in any of claims 1
and 4 to 6 or the process for producing it as
claimed in any of claims 2 and 4 to 6, wherein the
solid (IH) is heat-treated at temperatures between
80 and 300°C.

8. The multicoat system as claimed in any of claims 1
and 4 to 7, the process for producing it as

claimed in any of claims 2 and 4 to 7, or the reactive system as claimed in any of claims 3 to 5 and 7, wherein the constituent (IA), the coat (IIA) and/or the aqueous, thermally curable coating materials (IIB) comprise additives (J), especially polymers crosslinkers, crosslinking catalysts, initiators, especially photoinitiators, pigments, dyes, fillers, reinforcing fillers, rheological assistants, wetting agents and dispersants, defoamers, adhesion promoters, additives for improving substrate wetting, additives for improving surface smoothness, dulling agents, leveling agents, film-forming auxiliaries, driers, antiskinning agents, light stabilizers, corrosion inhibitors, biocides, flame retardants, polymerization inhibitors, especially photoinhibitors, or plasticizers.

9. The multicoat system as claimed in any of claims 1 and 4 to 8, the process for producing it as claimed in any of claims 2 and 4 to 8, or the reactive system as claimed in any of claims 3 to 5 and 8, wherein the coat (IIA) and/or the aqueous, thermally curable coating materials (IIB) comprise constituents which are curable with actinic light, especially UV radiation, and/or electron beams.

10. The use of the multicoat system as claimed in any of claims 1 and 4 to 9 or of the multicoat system

produced by the process as claimed in any of claims 2 and 4 to 9 as shaped parts and laminates, especially in automobile construction.

5 11. The use of the multicoat system as claimed in any of claims 1 and 4 to 9, of the multicoat system produced by the process as claimed in any of claims 2 and 4 to 9, or of the reactive system as claimed in any of claims 3 to 5, 8 and 9 in
10 automotive OEM finishing and refinish, in industrial coating, including coil coating, and in furniture coating.

12. An article, especially an automobile, coil or
15 furniture, comprising at least one multicoat system as claimed in any of claims 1 and 4 to 9 or at least one multicoat system produced with the process as claimed in any of claims 2 and 4 to 9.